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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,035	12/05/2001	Michael E. Lewis	72255/02773	1672
23380	7590	09/21/2004	EXAMINER	
TUCKER, ELLIS & WEST LLP 1150 HUNTINGTON BUILDING 925 EUCLID AVENUE CLEVELAND, OH 44115-1475				LIU, SHUWANG
ART UNIT		PAPER NUMBER		
		2634		

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/006,035	LEWIS, MICHAEL E.
	Examiner	Art Unit
	Shuwang Liu	2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 05 December 2001.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-25 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-25 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation of "at least one symbol includes a plurality of points causes a contradiction in the correlating step when only short symbols include a plurality of points.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 and 13-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moose (Patent Application Pub No US 2002/0065047) in view of

Yonge, III (US 6,111,919) (whereby "at least one symbol" in line 3 of claim 1 is interpreted to be "each symbol").

As shown in figures 2 and 4, Moose discloses a method and an apparatus of synchronizing an OFDM signal comprising the steps as following:

(1) regarding claims 1, 13 and 20:

receiving an OFDM signal including a plurality of long and short synchronization symbols, wherein (at least one) each symbol includes a plurality of points (see figure 2, 0024-0031);

correlating a predetermined number of points in a long symbol of the received OFDM signal with a delayed signal (figure 4);

obtaining a correlation peak between the received long symbol and the reference symbol, wherein the peak occurs at the time when the receiver acquires symbol synchronization (0057-0064 and claim 3).

Moose discloses all of the subject matter as described above except for specifically teaching correlating a predetermined number of points in a long symbol of the received OFDM signal against corresponding points in a reference symbol as claimed.

Yonge, III, in the same field of endeavor, teaches correlating a predetermined number of points of the received OFDM signal against corresponding points in a reference symbol (see figures 14 and 15, abstract, column 8, lines 37-59).

It would be desirable to provide reliable time synchronization in present of jammers emitting narrowband signals, faster correlation, and share the same FFT

processor (column 10, lines 4-16 and abstract, Yonge III) by using the cross-correlation (phase correlation) in the OFDM system. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the phase correlator as taught by Youge, III in the OFDM receiver of Moose in order to allow the receiver to demodulate the signal with the reliable time synchronization , faster correlation, and reducing the cost with sharing the same FFT processor.

(2) regarding claims 2, 14 and 21:

wherein the predetermined number of points is in a range of between 16 and 64 points (pp24-0025).

(3) regarding claims 3, 15 and 22:

further including the step of demodulating the OFDM signal's frequencies into the plurality of points (see figure 6).

(4) regarding claims 4, 16 and 23:

wherein the step of demodulating comprises applying a forward FFT to the signal, and the plurality of points applied to the forward FFT are points in a time sequence which is generated by applying an inverse FFT to the amplitudes of the plurality of subcarriers (see figure 6, 0034-0035,0045, claims 6 and 16).

(5) regarding claim 19:

the receiver component of claim13 wherein the receiver component comprises at least one of: an application-specific integrated circuit; a digital signal processor; and a hardware description of an algorithm (claim 6).

(6) regarding claims 5, 17 and 24:

Yonge, III further discloses the step of correlating includes multiplying each point of the symbol by the corresponding points to obtain a respective number of multiplication products (see 162 in figure 15).

(7) regarding claims 6, 18 and 25:

Yonge, III further discloses the step of obtaining a correlation peak comprises adding all the multiplication products into a correlation signal (see 168 in figure 15).

5. Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moose (Patent Application Pub No US 2002/0065047) and Yonge, III (US 6,111,919) as applied to claims 1-6 above, further in view of Langberg et al. (US 5,852,630).

Moose and Yonge, III disclose all of the subject matter as described above except for the method written by a software program embodied in a computer-readable medium.

However, Langberg et al. teaches that the method and apparatus for a transceiver warm start activation procedure with precoding can be implemented in software stored in a computer-readable medium. The computer-readable medium is an electronic, magnetic, optical, or other physical device or means that can contain or store a computer program for use by or in connection with a computer-related system or method (column 3, lines 51-65). One skilled in the art would have clearly recognized that the method of Moose and Yonge, III would have been implemented in software. The implemented software would perform same function of the hardware for less

expense, adaptability, and flexibility. Therefore, it would have been obvious to have used the software in the method of Moose and Yonge, III (US 6,111,919) as taught by Langberg et al. in order to reduce cost and improve the adaptability and flexibility of the communication system.

***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shuwang Liu whose telephone number is (571) 272-3036.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin, can be reached at (571) 272-3056.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:**

**(703) 872-9306 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.



Shuwang Liu  
Primary Examiner  
Art Unit 2634

September 17, 2004